

## Sieffert, Margaret

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**From:** Sieffert, Margaret  
**Sent:** Tuesday, June 20, 2017 2:21 PM  
**To:** Modak, Nabanita; Mia, Marcia; Hall, Charles  
**Cc:** Ayres, Sara  
**Subject:** RE: Illinois CISWI - Dyno Noble

Ok look for a meeting request in the future.

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**From:** Modak, Nabanita  
**Sent:** Tuesday, June 20, 2017 2:20 PM  
**To:** Sieffert, Margaret <Sieffert.Margaret@epa.gov>; Mia, Marcia <Mia.Marcia@epa.gov>; Hall, Charles <hall.charles@epa.gov>  
**Cc:** Ayres, Sara <Ayres.Sara@epa.gov>  
**Subject:** RE: Illinois CISWI - Dyno Noble

Margaret,  
How about a quick call between R5, OAQPS, and OECA and we can go from there?

Thanks  
Nabanita

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**From:** Sieffert, Margaret  
**Sent:** Tuesday, June 20, 2017 10:12 AM  
**To:** Mia, Marcia <[Mia.Marcia@epa.gov](mailto:Mia.Marcia@epa.gov)>; Modak, Nabanita <[Modak.Nabanita@epa.gov](mailto:Modak.Nabanita@epa.gov)>; Hall, Charles <[hall.charles@epa.gov](mailto:hall.charles@epa.gov)>  
**Cc:** Ayres, Sara <[Ayres.Sara@epa.gov](mailto:Ayres.Sara@epa.gov)>  
**Subject:** RE: Illinois CISWI - Dyno Noble

(b) (5)



Thanks, Margaret

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**From:** Mia, Marcia  
**Sent:** Tuesday, June 20, 2017 9:02 AM  
**To:** Modak, Nabanita <[Modak.Nabanita@epa.gov](mailto:Modak.Nabanita@epa.gov)>; Sieffert, Margaret <[Sieffert.Margaret@epa.gov](mailto:Sieffert.Margaret@epa.gov)>; Hall, Charles <[hall.charles@epa.gov](mailto:hall.charles@epa.gov)>  
**Cc:** Ayres, Sara <[Ayres.Sara@epa.gov](mailto:Ayres.Sara@epa.gov)>  
**Subject:** RE: Illinois CISWI - Dyno Noble

(b) (5)



(b) (5)

Marcia B Mia  
Office of Compliance/Air Branch  
2227A WJCS  
U.S. Environmental Protection Agency  
202-564-7042

---

**From:** Modak, Nabanita  
**Sent:** Monday, June 19, 2017 3:47 PM  
**To:** Sieffert, Margaret <[Sieffert.Margaret@epa.gov](mailto:Sieffert.Margaret@epa.gov)>; Hall, Charles <[hall.charles@epa.gov](mailto:hall.charles@epa.gov)>  
**Cc:** Mia, Marcia <[Mia.Marcia@epa.gov](mailto:Mia.Marcia@epa.gov)>; Ayres, Sara <[Ayres.Sara@epa.gov](mailto:Ayres.Sara@epa.gov)>  
**Subject:** FW: Illinois CISWI - Dyno Noble

Margaret,

(b) (5)

Thanks  
nabanita

---

**From:** Modak, Nabanita  
**Sent:** Thursday, June 01, 2017 6:30 PM  
**To:** Ayres, Sara <[Ayres.Sara@epa.gov](mailto:Ayres.Sara@epa.gov)>; Mia, Marcia <[Mia.Marcia@epa.gov](mailto:Mia.Marcia@epa.gov)>  
**Cc:** Sieffert, Margaret <[Sieffert.Margaret@epa.gov](mailto:Sieffert.Margaret@epa.gov)>; Hall, Charles <[hall.charles@epa.gov](mailto:hall.charles@epa.gov)>  
**Subject:** RE: Illinois CISWI - Dyno Noble

(b) (5)

[Redacted content]

(b) (5)

Thanks  
Nabanita

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**From:** Sieffert, Margaret  
**Sent:** Tuesday, May 30, 2017 3:39 PM  
**To:** Hall, Charles <[hall.charles@epa.gov](mailto:hall.charles@epa.gov)>; Modak, Nabanita <[Modak.Nabanita@epa.gov](mailto:Modak.Nabanita@epa.gov)>; Ayres, Sara <[Ayres.Sara@epa.gov](mailto:Ayres.Sara@epa.gov)>; Mia, Marcia <[Mia.Marcia@epa.gov](mailto:Mia.Marcia@epa.gov)>  
**Subject:** Illinois CISWI - Dyno Noble

Here is the response I received from Dyno Noble. Let me know if you have follow-up questions or if you believe EPA's response should be different than discussed.

Charlie let me know when you would like to discuss this with IEPA.

-Margaret

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**From:** Jacob Cauble [<mailto:jacob.cauble@am.dynonobel.com>]  
**Sent:** Tuesday, May 30, 2017 1:32 PM  
**To:** Sieffert, Margaret <[Sieffert.Margaret@epa.gov](mailto:Sieffert.Margaret@epa.gov)>  
**Cc:** Fred Jardinico <[fred.jardinico@am.dynonobel.com](mailto:fred.jardinico@am.dynonobel.com)>; Kathleen Blessing <[kathleen.blessing@am.dynonobel.com](mailto:kathleen.blessing@am.dynonobel.com)>  
**Subject:** FW: RE: FW: Description of MAGS

Margaret,

I'm forwarding a response from Terragon. Karolina has the answers to 2 and 3 reversed.

Best regards,  
**Jacob Cauble, CHMM**  
Regional Environmental Manager / West

**Dyno Nobel Inc.**  
A business of Incitec Pivot Limited  
Carthage Plant, 17562 Gum Road, Carthage, Missouri 64836, USA  
**Office:** +1 417 359 2253 | **Fax:** +1 417 359 2297 | **Mobile:** +1 417 388 8974  
<mailto:jacob.cauble@am.dynonobel.com>  
<http://www.dynonobel.com>

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**From:** [karolina.apland@terragon.net](mailto:karolina.apland@terragon.net) [<mailto:karolina.apland@terragon.net>]  
**Sent:** Tuesday, May 30, 2017 12:45 PM  
**To:** Jacob Cauble <[jacob.cauble@am.dynonobel.com](mailto:jacob.cauble@am.dynonobel.com)>  
**Cc:** [theodora.alexakis@terragon.net](mailto:theodora.alexakis@terragon.net)  
**Subject:** Fwd: RE: FW: Description of MAGS

Hi Jacob,

Please see answers to questions below as well as attachments.

Regards,

-Karolina

- 1. What specifically is in the waste stream? The email chain mentions it contains 60% plastic and PVC. Is the waste stream packed in the PVC? What is in the additional 40% of the waste stream?**

Biomedical waste is highly variable ranging from low plastic content (i.e. gauze, bandages etc.) to high plastic (i.e. catheter bags, tubing etc.). Two composition formulas were used during testing based on scientific literature of biomedical waste, an average formula and a high plastic formula:

	<b>A (Average formula)</b>	<b>B (high plastics)</b>
<b>Celluloid material</b>	56%	37%
<b>Plastics</b>	39%	62%
<b>Fluid (water)</b>	5%	1%

The plastic content was composed of mainly HDPE and LDPE with a PVC content ranging from 9% for formula A, to 16% for formula B. Again, the amounts of PVC were based on scientific literature for medical waste composition.

- 2. Could you please provide a key/legend for the graphs as well as provide a description of the x and y axis? Could you indicate in the graphs where fuel is started and stopped if diesel or natural gas is used?**

MAGS monitor the combustion chamber temperature directly by using a thermocouple positioned into the combustion chamber. This thermocouple is exposed to the combustion gases and operation temperature ranges from 900-1150°C. See part pdf attached

Oxygen content is monitored with an oxygen probe (0-21%) located on the exhaust stack. the gas samples is at temperature close to ambient since the gas cooling (quenching) and scrubbing occur prior to the final exhaust and condenser. See part pdf attached.

- 3. How does the MAGS unit monitor the temperature and oxygen? How is low oxygen maintained?**

The left axis is in Celsius degrees (te123,241,341), right axis is only an indicator of on or off (lsc260, lsc360)

LSC260 and LSC360 show when the unit is currently being loaded (260 for G200 gasifier, 360 for G300 gasifier)

The diesel injection is started when the combustion chamber temperature drops below 900°C and will remain active until temperature reaches 1040°C. The diesel status is not visible on char but temperature cycling is visible, we could easily generate graph with diesel status if requested.

----- Original Message -----

Subject: FW: Description of MAGS

Date: Mon, 22 May 2017 19:31:53 +0000

From: Jacob Cauble <[jacob.cauble@am.dynonobel.com](mailto:jacob.cauble@am.dynonobel.com)>

To: "[theodora.alexakis@terragon.net](mailto:theodora.alexakis@terragon.net)" <[theodora.alexakis@terragon.net](mailto:theodora.alexakis@terragon.net)>, "[karolina.apland@terragon.net](mailto:karolina.apland@terragon.net)" <[karolina.apland@terragon.net](mailto:karolina.apland@terragon.net)>

Karolina,

I passed on the information you provided to EPA in Illinois and they had the follow up questions below. Can you provide a response?

Best regards,

**Jacob Cauble, CHMM**

Regional Environmental Manager / West

**Dyno Nobel Inc.**

A business of Incitec Pivot Limited

Carthage Plant, 17562 Gum Road, Carthage, Missouri 64836, USA

**Office:** +1 417 359 2253 | **Fax:** +1 417 359 2297 | **Mobile:** +1 417 388 8974

<mailto:jacob.cauble@am.dynonobel.com>

<http://www.dynonobel.com>

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**From:** Sieffert, Margaret [<mailto:Sieffert.Margaret@epa.gov>]

**Sent:** Monday, May 22, 2017 2:23 PM

**To:** Jacob Cauble <[jacob.cauble@am.dynonobel.com](mailto:jacob.cauble@am.dynonobel.com)>

**Cc:** Hall, Charles <[hall.charles@epa.gov](mailto:hall.charles@epa.gov)>

**Subject:** RE: Description of MAGS

Hi Jacob,

Thank you for the email. After further review, we have some additional questions.

1. What specifically is in the waste stream? The email chain mentions it contains 60% plastic and PVC. Is the waste stream packed in the PVC? What is in the additional 40% of the waste stream?
2. Could you please provide a key/legend for the graphs as well as provide a description of the x and y axis? Could you indicate in the graphs where fuel is started and stopped if diesel or natural gas is used?
3. How does the MAGS unit monitor the temperature and oxygen? How is low oxygen maintained?

Based on the responses to the above questions, EPA plans to discuss this further with IEPA to determine the path forward. If you have questions, please let me know.

Margaret

---

**From:** Jacob Cauble [<mailto:jacob.cauble@am.dynonobel.com>]  
**Sent:** Thursday, May 11, 2017 2:07 PM  
**To:** Sieffert, Margaret <[Sieffert.Margaret@epa.gov](mailto:Sieffert.Margaret@epa.gov)>  
**Cc:** Fred Jardinico <[fred.jardinico@am.dynonobel.com](mailto:fred.jardinico@am.dynonobel.com)>; Kathleen Blessing <[kathleen.blessing@am.dynonobel.com](mailto:kathleen.blessing@am.dynonobel.com)>  
**Subject:** RE: Description of MAGS

Margaret,

I've included a response from Terragon, the manufacturer of the MAGS unit. The first four questions you asked are answered with the following response and the attached pdf file. Question 5 is answered with the attached jpg files.

Response to Questions 1 to 4:

Hi Jacob,

I am sending you a pdf of the results from measured emissions testing performed at Terragon in December 2014. I am assuming, that as usual, measured emissions will be more useful to you than calculated ones. This particular testing was performed using a waste stream that would result in a worst case emissions profile. It is an elevated plastic content including PVC. The emissions also contain any diesel combustion that occurred during testing.

Best regards,

**Jacob Cauble, CHMM**

Regional Environmental Manager / West

**Dyno Nobel Inc.**

A business of Incitec Pivot Limited

Carthage Plant, 17562 Gum Road, Carthage, Missouri 64836, USA

**Office:** +1 417 359 2253 | **Fax:** +1 417 359 2297 | **Mobile:** +1 417 388 8974

<mailto:jacob.cauble@am.dynonobel.com>

<http://www.dynonobel.com>

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**From:** [karolina.apland@terragon.net](mailto:karolina.apland@terragon.net) [<mailto:karolina.apland@terragon.net>]

**Sent:** Monday, March 20, 2017 1:07 PM

**To:** Jacob Cauble <[jacob.cauble@am.dynonobel.com](mailto:jacob.cauble@am.dynonobel.com)>

**Cc:** [theodora.alexakis@terragon.net](mailto:theodora.alexakis@terragon.net)

**Subject:** Fwd: RE: Description of MAGS

Hi Jacob,

I am sending you information relative to the questions you sent. I have left the questions pertaining to the emissions data blank as I want to confirm the source of the data referred to (see message below).

Best,

Karolina Apland

[karolina.apland@terragon.net](mailto:karolina.apland@terragon.net)

1. Confirm whether the emission values provided on the spreadsheet are measured or calculated?
2. The emission that is reported under "Syngas" , where was the emission measured or calculated ( at the downstream of air pollution control device or at the upstream)?
3. The total emission seems to be a simple addition of fuel emission and syngas emission. Any idea why weight % was not accounted for or, if it was accounted for what was the basis for assuming equal weight%?
4. The emissions data needs to include HCl, dioxins, dibenzofurans, mercury, cadmium, and lead. Data from December 2014 MAGS V7 using a 60% plastic waste mixture.

Parameter	MAGS	Units
Cadmium	0.22	ug/m <sup>3</sup>
Dioxins/furans <b>(total basis)</b>	1.02	ng/m <sup>3</sup>
Dioxins/furans <b>(TEQ)</b>	0.000001	ug/m <sup>3</sup>
Hydrogen chloride	0.56	ppmdv
Lead	5.19	ug/m <sup>3</sup>
Mercury	0.81	ug/m <sup>3</sup>
<i>All emission limitations are measured at 7 percent oxygen, dry basis at standard conditions.</i>		

5. Provide a temperature profile of the gasifier chamber from startup through completion and indicate on the profile, the changes in process steps (e.g. when is the waste introduced into the chamber) Please refer to the attached graphs. The Orange and blue lines at the bottom of the graphs represent when waste was loaded in the system. The fuel used on these day was dry garbage. Data from in

house MAGS V8.14 taken February 28<sup>th</sup> 2017.

6. By what process does the manufacturer confirm minimization of dioxin creation (e.g. fast quenching).

Leaving the heat exchange zone below the Gasifiers, the exhaust gases are instantly quenched with water in a Venturi to a temperature of less than 80°C. The water quench serves to stop any recombination reactions that may form toxic compounds such as dioxins and furans. By bringing the hot exhaust in intimate contact with water, the Venturi also transfers most particles that may be in the exhaust to the water where they can be recovered in the water purification system. The cold exhaust gas is fed into a packed column caustic scrubber to remove all remaining particulates and acid gases. A condenser is used to remove moisture from the exhaust gas prior to discharge.

7. Is there any processing of the syngas before it enters the combustion chamber, for example, does the syngas go through any filter prior to combustion?

No, the syngas does not go through any filter prior to combustion. Exhaust gases are thoroughly treated following combustion. See answer above.

----- Original Message -----

Subject: Fwd: RE: Description of MAGS

Date: Wed, 15 Mar 2017 17:02:06 -0400

From: [karolina.apland@terragon.net](mailto:karolina.apland@terragon.net)

To: [jacob.cauble@am.dynonobel.com](mailto:jacob.cauble@am.dynonobel.com)

Hi Jacob,

I just wanted to confirm with you the emissions spreadsheet referred to in the questions you have sent. Could you please send me what is being referenced in the questions below.

Best Regards,

Karolina Apland

[karolina.apland@terragon.net](mailto:karolina.apland@terragon.net)

----- Original Message -----

Subject: RE: Description of MAGS

Date: Fri, 10 Mar 2017 11:21:43 -0500

From: "Theodora Alexakis" <[theodora.alexakis@terragon.net](mailto:theodora.alexakis@terragon.net)>

To: "Jacob Cauble" <[jacob.cauble@am.dynonobel.com](mailto:jacob.cauble@am.dynonobel.com)>

Hello Jacob,

I will be away from the office over the next couple of weeks, but I have copied my colleague, Karolina Apland, our Environmental Specialist, who will provide answers to your questions over the next week or so. She is actually coming back from maternity leave on a part time basis and will follow up with you directly.

We are very excited to work with you on a second installation, so please rest assured that we are here to help you, as needed.

Best regards,

Theodora Alexakis, Eng., PhD

VP, Business Development

Tel: (514) 938-3772 ext 229

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**From:** Jacob Cauble [<mailto:jacob.cauble@am.dynonobel.com>]  
**Sent:** March 10, 2017 7:16 AM  
**To:** Theodora Alexakis  
**Subject:** FW: Description of MAGS

Theodora,

I've been in discussions with Illinois EPA on the permitting requirements of a MAGS unit at our Wolf Lake plant. Please take a look at the questions below. I need to provide this information to them.

Best regards,

**Jacob Cauble, CHMM**

Regional Environmental Manager / West

**Dyno Nobel Inc.**

A business of Incitec Pivot Limited

Carthage Plant, 17562 Gum Road, Carthage, Missouri 64836, USA

**Office:** +1 417 359 2253 | **Fax:** +1 417 359 2297 | **Mobile:** +1 417 388 8974

<mailto:jacob.cauble@am.dynonobel.com>

<http://www.dynonobel.com>

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---

**From:** Sieffert, Margaret [<mailto:Sieffert.Margaret@epa.gov>]  
**Sent:** Thursday, March 09, 2017 1:54 PM  
**To:** Jacob Cauble <[jacob.cauble@am.dynonobel.com](mailto:jacob.cauble@am.dynonobel.com)>  
**Cc:** Fred Jardinico <[fred.jardinico@am.dynonobel.com](mailto:fred.jardinico@am.dynonobel.com)>; Kathleen Blessing <[kathleen.blessing@am.dynonobel.com](mailto:kathleen.blessing@am.dynonobel.com)>; Hall, Charles <[hall.charles@epa.gov](mailto:hall.charles@epa.gov)>  
**Subject:** RE: Description of MAGS

Jacob, I have circulated your summary to those on the call from EPA and below are comments along with additional questions EPA has regarding the system.

1. Confirm whether the emission values provided on the spreadsheet are measured or calculated?
2. The emission that is reported under "Syngas" , where was the emission measured or calculated ( at the downstream of air pollution control device or at the upstream)?
3. The total emission seems to be a simple addition of fuel emission and syngas emission. Any idea why weight % was not accounted for or, if it was accounted for what was the basis for assuming equal weight%?
4. The emissions data needs to include HCl, [dioxins](#), [dibenzofurans](#), mercury, cadmium, and lead.
5. Provide a temperature profile of the gasifier chamber from startup through completion and indicate on the profile, the changes in process steps (e.g. when is the waste introduced into the chamber)
6. By what process does the manufacturer confirm minimization of dioxin creation (e.g. fast quenching).
7. Is there any processing of the syngas before it enters the combustion chamber, for example , does the syngas go through any filter prior to combustion?

At this time I would like to explain how EPA handles providing guidance and applicability determinations. EPA is happy to provide guidance via email and phone conversations but we would like to explain that if Dyno Nobel would like to get an official applicability determination then the procedure will be to submit the request (and we can provide you the specifics at a later time) and an official response would be provided to you as well as entered into EPA's collective applicability determination index (<https://cfpub.epa.gov/adi/>) in a way to help maintain national consistency. Discussions on guidance could be worked on simultaneously with an official applicability determination so no delay should be incurred. I have copied Charlie Hall on this email as he would be the contact if an official applicability determination request will be pursued.

Thanks, Margaret

Margaret Sieffert | U.S. Environmental Protection Agency R5

Air & Radiation Division | Air Toxics and Assessment Branch

77 W. Jackson Blvd. (AT-18J) | Chicago, IL 60604 | 312.353.1151

---

**From:** Jacob Cauble [<mailto:jacob.cauble@am.dynonobel.com>]

**Sent:** Wednesday, March 08, 2017 2:51 PM

**To:** Sieffert, Margaret <[Sieffert.Margaret@epa.gov](mailto:Sieffert.Margaret@epa.gov)>

**Cc:** Fred Jardinico <[fred.jardinico@am.dynonobel.com](mailto:fred.jardinico@am.dynonobel.com)>; Kathleen Blessing <[kathleen.blessing@am.dynonobel.com](mailto:kathleen.blessing@am.dynonobel.com)>

**Subject:** RE: Description of MAGS

Margaret,

Thanks for organizing the call.

I've also copied on this email:

Fred Jardinico, Senior Director – Environment

Kathleen Blessing, Regional Environmental Manager - East

Please read through my summary of the action items and make sure they are accurate and whether or not anything else is needed. I will begin collecting the information.

1. Confirm whether the emission values provided on the spreadsheet are measured or calculated?
2. The emissions data needs to include HCl, dioxin, benzofuran, mercury, cadmium, and lead.
3. Provide a temperature profile of the gasifier chamber from startup through completion and indicate on the profile, the changes in process steps (e.g. when is the waste introduced into the chamber)
4. By what process does the manufacturer confirm minimization of dioxin creation (e.g. fast quenching).

Best regards,

**Jacob Cauble, CHMM**

Regional Environmental Manager / West

**Dyno Nobel Inc.**

A business of Incitec Pivot Limited

Carthage Plant, 17562 Gum Road, Carthage, Missouri 64836, USA

**Office:** +1 417 359 2253 | **Fax:** +1 417 359 2297 | **Mobile:** +1 417 388 8974

<mailto:jacob.cauble@am.dynonobel.com>

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**From:** Sieffert, Margaret [<mailto:Sieffert.Margaret@epa.gov>]

**Sent:** Wednesday, March 08, 2017 8:50 AM

**To:** Jacob Cauble <[jacob.cauble@am.dynonobel.com](mailto:jacob.cauble@am.dynonobel.com)>

**Subject:** RE: Description of MAGS

We are scheduled for 2-3pm cst

The conference line will be 877-226-9607 code – 9505116497

Talk to you soon

---

**From:** Jacob Cauble [<mailto:jacob.cauble@am.dynonobel.com>]  
**Sent:** Wednesday, March 08, 2017 7:42 AM  
**To:** Sieffert, Margaret <[Sieffert.Margaret@epa.gov](mailto:Sieffert.Margaret@epa.gov)>  
**Subject:** Re: Description of MAGS

If today will work, I'd like to get it rolling, otherwise next week is fine.

-Jacob

Sent from my iPhone

On Mar 8, 2017, at 7:30 AM, Sieffert, Margaret <[Sieffert.Margaret@epa.gov](mailto:Sieffert.Margaret@epa.gov)> wrote:

I think we might be set with next Tuesday at 10 cst but waiting to hear back from one more person. If you prefer today at 1pm cst, I can check with everyone.

-Margaret

---

**From:** Jacob Cauble [<mailto:jacob.cauble@am.dynonobel.com>]  
**Sent:** Wednesday, March 08, 2017 7:10 AM  
**To:** Sieffert, Margaret <[Sieffert.Margaret@epa.gov](mailto:Sieffert.Margaret@epa.gov)>  
**Subject:** RE: Description of MAGS

I'm free today after 1 pm CST

Best regards,

**Jacob Cauble, CHMM**

Regional Environmental Manager / West

**Dyno Nobel Inc.**

A business of Incitec Pivot Limited

Carthage Plant, 17562 Gum Road, Carthage, Missouri 64836, USA

**Office:** +1 417 359 2253 | **Fax:** +1 417 359 2297 | **Mobile:** +1 417 388 8974

<mailto:jacob.cauble@am.dynonobel.com>

<http://www.dynonobel.com>

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**From:** Sieffert, Margaret [<mailto:Sieffert.Margaret@epa.gov>]  
**Sent:** Tuesday, March 07, 2017 1:32 PM  
**To:** Jacob Cauble <[jacob.cauble@am.dynonobel.com](mailto:jacob.cauble@am.dynonobel.com)>  
**Subject:** RE: Description of MAGS

Jacob,

We would like to have a conference call with you to discuss a few questions. Would you be available this week or next to talk? Please let me know your availability and I will set something up with several staff here from R5, OAQPS and OECA.

Thanks, Margaret

---

**From:** Jacob Cauble [<mailto:jacob.cauble@am.dynonobel.com>]  
**Sent:** Wednesday, March 01, 2017 9:11 AM  
**To:** Sieffert, Margaret <[Sieffert.Margaret@epa.gov](mailto:Sieffert.Margaret@epa.gov)>  
**Subject:** RE: Description of MAGS

I don't think CISWI applies because the unit is fundamentally different than an incinerator. IL EPA was unsure about this and that's why I reached out to you. I guess what I'm really trying to figure out is are there current applicability standards for gasifiers that you are aware of or does it require any air permitting at all?

Best regards,

**Jacob Cauble, CHMM**

Regional Environmental Manager / West

**Dyno Nobel Inc.**

A business of Incitec Pivot Limited

Carthage Plant, 17562 Gum Road, Carthage, Missouri 64836, USA

**Office:** +1 417 359 2253 | **Fax:** +1 417 359 2297 | **Mobile:** +1 417 388 8974

<mailto:jacob.cauble@am.dynonobel.com>

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**From:** Sieffert, Margaret [<mailto:Sieffert.Margaret@epa.gov>]  
**Sent:** Tuesday, February 28, 2017 2:33 PM

**To:** Jacob Cauble <[jacob.cauble@am.dynonobel.com](mailto:jacob.cauble@am.dynonobel.com)>

**Subject:** RE: Description of MAGS

Sorry I mistakenly put DDDD which is the emission guidelines for existing CISWI units and think you might be asking about CCCC instead as it pertains to new CISWI units.

-Margaret

---

**From:** Sieffert, Margaret

**Sent:** Tuesday, February 28, 2017 1:05 PM

**To:** 'Jacob Cauble' <[jacob.cauble@am.dynonobel.com](mailto:jacob.cauble@am.dynonobel.com)>

**Subject:** RE: Description of MAGS

Jacob,

Thank you for your email. I have shared your email with a few staff and we are reviewing the information. We just wanted to ask a clarifying question. Are you seeking guidance under CISWI (40 CFR Subpart DDDD) or OSWI (40 CFR Subpart EEEE)? Your email mentions both EEEE and CISWI.

-Thanks, Margaret

**Margaret Sieffert | U.S. Environmental Protection Agency R5**

**Air & Radiation Division | Air Toxics and Assessment Branch**

**77 W. Jackson Blvd. (AT-18J) | Chicago, IL 60604 | 312.353.1151**

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**From:** Jacob Cauble [<mailto:jacob.cauble@am.dynonobel.com>]

**Sent:** Thursday, February 23, 2017 6:34 AM

**To:** Sieffert, Margaret <[Sieffert.Margaret@epa.gov](mailto:Sieffert.Margaret@epa.gov)>

**Cc:** Fred Jardinico <[fred.jardinico@am.dynonobel.com](mailto:fred.jardinico@am.dynonobel.com)>; Kathleen Blessing <[kathleen.blessing@am.dynonobel.com](mailto:kathleen.blessing@am.dynonobel.com)>

**Subject:** FW: Description of MAGS

Margaret,

Per the correspondence below, I've been working with Bob Bernoteit with IL EPA on the air permitting needs for a gasification system. Dyno Nobel has installed the same system in Missouri and it was determined that no air permitting was needed. I'd like to go through the permitting review process for installation at our plant in Wolf Lake, IL. At the bottom of the email thread, there is a description of the system. Can you offer guidance on what will be needed for the review?

Best regards,

**Jacob Cauble, CHMM**

Regional Environmental Manager / West

**Dyno Nobel Inc.**

A business of Incitec Pivot Limited

Carthage Plant, 17562 Gum Road, Carthage, Missouri 64836, USA

**Office:** +1 417 359 2253 | **Fax:** +1 417 359 2297 | **Mobile:** +1 417 388 8974

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**From:** Bernoteit, Bob [<mailto:Bob.Bernoteit@Illinois.gov>]

**Sent:** Wednesday, February 22, 2017 4:04 PM

**To:** Jacob Cauble <[jacob.cauble@am.dynonobel.com](mailto:jacob.cauble@am.dynonobel.com)>

**Cc:** Smet, Robert <[Robert.Smet@Illinois.gov](mailto:Robert.Smet@Illinois.gov)>

**Subject:** Description of MAGS

Jacob,

We recommend that you should contact Margaret Sieffert at USEPA Region 5 and/or Nabanita Modak at USEPA OAQPS to get it straight from them as to what rules apply. We think 40 CFR 60 Subpart EEEE does apply, but contacting these USEPA experts on CISWI (we assume they are knowledgeable about incineration/gasification also) will save us both a lot of time. Their email addresses are:

[Sieffert.Margaret@epa.gov](mailto:Sieffert.Margaret@epa.gov)

[Modak.Nabanita@epa.gov](mailto:Modak.Nabanita@epa.gov)

Bob Bernoteit

FESOP Unit Manager,

Illinois EPA, Division of Air Pollution Control - Permit Section

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**From:** Jacob Cauble [<mailto:jacob.cauble@am.dynonobel.com>]

**Sent:** Wednesday, February 22, 2017 3:45 PM

**To:** Bernoteit, Bob

**Subject:** [External] Description of MAGS

Bob,

I included a description of the MAGS unit below based on our application. I don't think it falls into the incinerator classification, but if I'm understanding incorrectly, please let me know. As described, can you provide guidance on what the regulatory requirements are for a gasifier?

The breakdown of waste material begins with a bag of waste being dropped into a heated gasification chamber (gasifier) where high temperatures break down the waste into a solid bio-char and a synthetic gaseous fuel (syngas). Biochar is collected at the bottom of the gasifier while the syngas travels into the combustion chamber where it is ignited. This hot gas produced by combustion re-circulates to maintain the elevated temperature needed to heat the gasifier and continue the gasification process. The exhaust gases are instantly cooled by water and processed through the scrubber to be cleansed of any pollutants. Additionally, the process recovers thermal energy to be reused by the facility in the form of hot water. Additional information can be reviewed at the manufacturer's (Terragon Environmental Technologies, Inc.) website, [www.terragon.net](http://www.terragon.net), and on the internet by searching Micro Auto Gasification Systems or MAGS.

To begin the process system, diesel or natural gas is used to heat the combustion chamber to 1,100 C. Once this temperature is reached, its exhaust is directed towards a heat exchange zone located at the bottom of the gasifier. The waste within the gasifier heats, dries, and begins gasifying (i.e., producing syngas). When the concentration of syngas is sufficient, the diesel/natural gas burner switches off and the syngas serves as the main fuel for the combustion chamber.

Exhaust gases leave the heat exchange zone below the gasifier at a temperature higher than 700 C and are instantly quenched with water in a Venturi to a temperature less than 80 C. The water quench serves to stop any recombination reactions that may form toxic compounds such as dioxins and furans. By bringing the hot exhaust in contact with water, the Venturi also transfers most particles that may be in the exhaust to the water where they can be recovered in the water purification system. The cold exhaust gas is fed into a packed column caustic scrubber to remove all remaining particulates and acid gases. A condenser is used to remove moisture from the exhaust gas prior to discharge.

The process is complete when all of the organic waste is fully gasified and the production of synthesis gas stops. The residue, which is mostly inorganic carbon in the form of bio-char, is recovered as a sterilized inert material that can be stored or discharged safely.

Best regards,

**Jacob Cauble, CHMM**

Regional Environmental Manager / West

**Dyno Nobel Inc.**

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**From:** Bernoteit, Bob [<mailto:Bob.Bernoteit@Illinois.gov>]  
**Sent:** Friday, February 17, 2017 10:44 AM  
**To:** Jacob Cauble <[jacob.cauble@am.dynonobel.com](mailto:jacob.cauble@am.dynonobel.com)>  
**Cc:** Frost, Brad <[Brad.Frost@Illinois.gov](mailto:Brad.Frost@Illinois.gov)>; Stewart, Rachel <[Rachel.Stewart@illinois.gov](mailto:Rachel.Stewart@illinois.gov)>;  
Matoesian, Charles <[Charles.Matoesian@Illinois.gov](mailto:Charles.Matoesian@Illinois.gov)>; Dragovich, Ted  
<[Ted.Dragovich@Illinois.gov](mailto:Ted.Dragovich@Illinois.gov)>; Smet, Robert <[Robert.Smet@Illinois.gov](mailto:Robert.Smet@Illinois.gov)>  
**Subject:** Attendees on this morning's conference call

Jacob,

The Agency's attendees on this morning's conference call besides myself were:

Brad Frost, Office of Community Relations;

Rachel Stewart, Office of Community Relations;

Charles Matoesian, Division of Legal Counsel-Air Regulatory Unit;

Ted Dragovich, Bureau of Land-Permit Section;

Bob Smet, Bureau of Air-Permit Section-Major Source Construction Unit

Bob Bernoteit

FESOP Unit Manager,

Illinois EPA, Division of Air Pollution Control - Permit Section

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